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Methodological Choices
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Handling the Hawthorne effect: The challenges surrounding a participant observer

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Abstract

Participant observation can be an excellent way to gather qualitative data and observe **real** behaviours, provided the participant observer does not cause a behavioural change from the norm. Such a change in behaviour is known as the Hawthorne effect – where people modify their behaviour when they know they are being watched or studied. The Hawthorne effect is one of the greatest challenges research observers face when gathering data and has long been described as the ‘Achilles heel’ of participant research (Coombs and Smith, 2003). This challenge is discussed based on experiences from gathering data on behavioural safety and attitudes on a very large civil engineering construction project currently underway in the UK. The proposed six-stage protocol helped the participant observer witness real behaviours and true attitudes of the workforce while limiting the potential negative consequences of the Hawthorne effect. A case study example using this protocol suggests that it is important that the researcher becomes successfully immersed in the social setting by gaining trust and making the workers feel relaxed and unthreatened. The paper also discusses other challenges associated with an ethnographic approach including validity, bias, interpreting evidence and analysing the data collected.

Introduction

The Hawthorne effect is when there is a change in the subject’s normal behaviour, attributed to the knowledge that their behaviour is being watched or studied. There are actually several similar definitions of the Hawthorne effect (as discussed below), but this definition will be used for the purpose of this paper. The Hawthorne effect and other forms of reactivity can contaminate the pure social environment being studied (Hunt, 1985). Therefore it is of no great surprise that there are many ethnographers that are concerned about this phenomenon (O’Reilly, 2009). This concern has resulted in some ethnographers using covert observations to avoid any reactivity, such as in Rawlinson et al (2010). Ethnography usually occurs on a long-term basis, and such sustained observation can be used as a check against reactivity, such as the Hawthorne effect (Adair, 1984). However,

sustained observation alone does not necessarily guarantee success in overcoming reactivity, as ethnographers also rely on building trusting relationships (Carroll and Mesman, 2011) usually through participant observation. This paper proposes a six-stage protocol that aims to aid the participant observer in overcoming the Hawthorne effect through establishing rapport and building these trusting relationships. This protocol was used on a large civil engineering project (+£500m) in the UK, where attitudes towards safety and safety-related behaviours of the workforce were investigated. Using this protocol as a guideline, the participant observer was able to establish rapport with the workforce and witness real behaviours and true attitudes, while limiting any potential negative effects caused by the Hawthorne effect. A case study example of the protocol in use demonstrates that the participant observer's subject reveals attitudes towards safety which would not ordinarily be observed before establishing rapport. Hence, this contribution illustrates that any negative effects potentially caused by the Hawthorne effect can be limited, even in confrontational environments such as the construction industry, and by using this protocol to establish rapport, real behaviours and true attitudes can be observed.

The researcher has been undertaking an ethnographic methodology for the past 18 months on a large civil engineering project in the UK. The main technique used by ethnographers is participant observation. De Walt et al. (1998) describe four different types of participant observation: passive (researcher has a bystander role), moderate (researcher has a balance of insider and outsider roles), active (researcher participates in certain or all activities) and complete (researcher is completely integrated). A 'moderate participation' stance was undertaken to have a balance of insider and outsider roles, allowing a worthy combination of involvement and necessary detachment to remain objective (De Walt et al., 1998). The participant observer's 'insider' roles occurred two to three times a week during the core business hours (08:00 to 17:00) and primarily involved interacting with the workforce and attending meetings, while observing and recording findings. The researcher employed an overt approach, although there were rare occasions when a covert approach was unintentionally applied. An open approach does inform the subjects that they are being studied and could cause reactive behaviour. As it is ethically important to introduce the researcher's purpose, my position within the company was described as 'a researcher investigating health and safety'. Health and safety is a sensitive issue in construction, and this overt approach could alter the subject's behaviours.

The structure of this paper is in three distinct parts. The following section positions the researcher and discusses the relevant literature including the initial identification of the Hawthorne effect, its definition, challenges, criticisms and attempts to overcome it. The next section introduces the findings and, in particular, the six stage protocol that has developed from the researcher's experience in an attempt to overcome and

avoid the Hawthorne effect in research practice. The final section addresses other challenges the observer faces including interpreting evidence, validity, reliability and bias.

The Hawthorne effect

The 'Hawthorne effect' is a phrase derived from experiments in the Hawthorne Works of the Western Electric Company in Chicago between 1927 and 1933 (Chiesa and Hobbs, 2008). The aim of the experiments was to investigate whether certain physical features of the factory, such as lighting, impacted the productivity. However, instead the Hawthorne effect phenomenon was accidentally identified. Though there is no universal definition of the Hawthorne effect, it is generally accepted to be the phenomenon where participants in an experimental study alter their behaviour or performance because they are aware that they are being observed (Campbell, Maxey and Watson, 1995). The first use of the term appears to have been in the early 1950s (French, 1953) and the phrase has been used in academic texts since (Chiesa and Hobbs, 2008). It still plays a key role in the methodology of experiments, has a widespread influence in research (Jones, 1992) and demonstrates just how difficult it is to understand human behaviour in the workplace (Holden, 2001).

The Hawthorne Studies comprised of six partly overlapping studies at Western Electric Company between 1924 and 1933 including: the illumination studies (1924-27), the first (1927-33) and second (1928-1929) relay assembly group studies, the micra splitting test room (1928-30), the interview program (1928-30) and the bank wiring observation room study (1931-32). In industrial sociology or psychology, there has perhaps been no other set of experiments or theory that has stimulated as much research and controversy as the Hawthorne studies (Adair, 1984). The two most famous experiments are the illumination studies and the first relay assembly group studies:

The illumination studies were undertaken between November 1924 and April 1927 after the electrical suppliers of Western Electric claimed that better lighting would improve productivity output (Gale, 2004). As expected when the lighting was high, the productivity increased. However, quite unexpectedly, when the lighting was low, at around a moonlight level, productivity still increased (Adair, 1984). The data was never formally reported and it is unknown how many participants were studied (Kompier, 2006) but a report by Snow (1927: 257-82), a representative from the research sponsor, concluded that:

The corresponding production efficiencies by no means followed the magnitude or trend of the lighting intensities. The output bobbed up and down without direct relation to the amount of illumination.

Original investigators were perplexed by the findings but realised that there were other factors contributing to output.

The second form of experiment, the first relay study, inspired by the illumination study, was a very famous experiment (Kompier, 2006). It was an extremely detailed study based on five women for a five year period. The research aimed to identify how production of relays (a part used in the construction of a telephone) could be increased and what factors influenced the women's work production rate. During this study various factors changed, including the introduction of breaks, breaks with food and a shortened working day (Kompier, 2006). One might suspect that the productivity rate would decrease from the introduction of these changes, yet each time a change occurred, production increased. The observers found this very puzzling, but what was even more confusing was that when the working day structure returned to the norm, with no breaks, hot lunches or incentive pay, then production peaked (Blalock and Blalock, 1968). No matter what the changes were, whether the day was shorter or longer, had more or less rest periods, an increase in productivity was still observed (Ruch and Zimbardo, 1971). It was concluded that since the workers knew that the experimenters expected the workplace adjustments to affect them, their behaviour changed (Elmes et al., 1985) because of the attention (Ruch and Zimbardo, 1971) that they were receiving.

The greatest criticism of the methodology of the Hawthorne experiments was that two of the female subjects were allegedly changed during the experiment. Though there is contradicting evidence on this matter with Mayo (1933) stating they 'dropped out', while Roethlisberger (1941) suggests that there were not any replacements after the first year and a half, stating that 'everyone was happy'. Regardless of whether the method was sloppy or not, the research work presented in the Hawthorne studies was ground-breaking.

The research on the Hawthorne experiments was incredibly detailed, which has given the opportunity for researchers to re-interpret the findings repeatedly. However, according to Kompier (2006) many have misinterpreted, which has meant there is no universal agreement on the findings of the Hawthorne studies and on the definition of the Hawthorne effect itself. More recently, it has become common to attribute any unexpected result within an experiment with human participants to the Hawthorne effect (Wickstrom and Bendix, 2000). Authors, such as Olson et al. (2004) and Chiesa and Hobbs (2008), have argued that the term 'Hawthorne effect' is often used inappropriately and refers to such a wide range and often contradictory phenomena. Such phenomena include the John Henry effect, reactivity, social facilitation (Chiesa and Hobbs, 2008) and the placebo effect, a term sometimes used as a social equivalent to the Hawthorne effect (Wickstrom and Bendix, 2000).

It appears that in almost every academic piece of work, each author has their own definition for the Hawthorne effect and some even have two

(as in Davis and Shackleton, 1975), which can be confusing. Nevertheless, the central idea appears to consistently be that the Hawthorne effect is a change in behaviour or increase in performance due to the subject's knowledge that they are being observed. For the purpose of clarity in this study, the Hawthorne effect is defined here as *a change in the subject's normal behaviour, attributed to the knowledge that their behaviour is being watched or studied*.

In an effort to overcome any adverse reactions from the Hawthorne effect, a separate control group – a group separated from the rest of the experiment, independent of the variable being tested, that can be used as a comparison – could be used. However, the Hawthorne effect can still occur in these situations, just in another and more specific form known as the 'John Henry effect', where the control group behaves differently based on the knowledge that they are the control group. This term was first used by Gary Saretsky (1972) to describe the story of an American steel driver in the 1870s. John Henry is an American folk hero that has his own statue in West Virginia and has many songs, stories, novels and plays based on him. Henry was a steel driver, a profession which involved hammering into rocks to create space for explosives to blast away the rock. In the legend, his work rate was being measured against a steam powered hammer. In reaction to being compared with this machine, Henry worked so hard and tirelessly that he died in victory holding his hammer. The 'John Henry effect' was based on this 'tall tale' as when made aware he was essentially an experimental control, Henry reacted by working extremely hard.

Another attempt to overcome the Hawthorne effect is the process of triangulation. Triangulation is the use of more than one approach to an investigation in order to enhance confidence in the findings (Bryman, 2003). This approach may overcome the problems arising from the Hawthorne effect better than single method approaches such as controlled trials (Holden, 2001). It is an important technique for the researcher in any observational study and should be used to cross-check, compare and triangulate any information before it builds the basis of a knowledge foundation (Fetterman, 2010). In some research projects it is possible that full participant observation can reduce the number of subjects altering their behaviour when they are being observed (Bernard, 1994).

The Hawthorne experiments accidentally discovered what is now known as the Hawthorne effect. This effect can contaminate the natural social environment being studied, and hence overcoming any adverse effects of this phenomenon is very important. For this particular study on a large civil engineering project, this was achieved using the following six-stage protocol as a guideline for establishing rapport and making the subjects feel relaxed in the presence of a participant observer.

Application: Developing the six-stage protocol

'You must be clever to be at University... aged 12.'

This was a light-hearted and cheeky comment made in reference to my youthful looks by one of the construction workers, before he proceeded to answer his mobile phone in an unsafe area. Most people would probably take this comment as an offence, but I was in fact delighted. Becoming immersed into a social setting without changing behaviours is very challenging and this was a message that, even though I was a researcher investigating behavioural safety, I appeared not to be perceived as a threat, not to be influencing their behaviour and that the workers seemed relaxed around me. I was making headway in becoming what Kellehear (1993) calls an *unobtrusive* researcher.

The experience of feeling like an outsider is not uncommon amongst ethnographers (Pink et al., 2013). Agar (1996) even titled his book as the 'Professional Stranger: An Informal Introduction to Ethnography'. It is necessary for an ethnographer to build relationships with surrounding participants (Jorgensen, 1989) in order to extract more accurate and detailed data. The construction industry in particular has been highlighted for having a confrontational nature (such as in Smith, 1992 and Latham, 1994). Loosemore (1998) stated that the confrontational nature of the industry was as much of a threat to effective research as it is to effective construction management. In methodological terms, there are particular challenges of emotion, sensitivity, tension, stress, pressure and uncertainty that the researcher needs to address. Though this confrontational nature only exacerbates the researchers challenge, an ethnographic approach does hold considerable promise for addressing practical, problem-based research concerned with construction sites, despite being infrequently used by construction researchers (Pink et al., 2010).

Building relationships through conversation

Relationships are built through conversations with surrounding participants and are a key part of participant observation. This is a significant challenge for the ethnographer especially in industries that are fraught with confrontation such as the construction industry. Building relations will not only improve the quality of data but also reduce the chances of the findings being influenced by the Hawthorne effect. But there are challenges in developing these conversations, which can be summarised as follows:

- Becoming immersed and accepted in the community (Fetterman, 2010)
- Building relationships with surrounding participants (Jorgensen, 1989)
- Ensuring people find you trustworthy and are relaxed around you (Fetterman, 2010)

- Extracting accurate information of interest from the conversation (Fetterman, 2010)
- Language barriers (Guest, Namey and Mitchell, 2013)
- Ethical issues (Kellehear, 1993)
- Conversation time restrictions

A protocol for Hawthorne effect mitigation

The six key stages developed in this paper (shown in Figure 1) are proposed to act as a protocol for participant researchers during conversations. It is more likely that the data collected from the conversation will be more accurate if the first five stages are completed before the conversation is led in the direction the participant wishes to explore, namely in the area that the observer is researching. To demonstrate this protocol and understand its development, a case example is provided, based on a real conversation with a worker on a large civil engineering construction project in the UK.

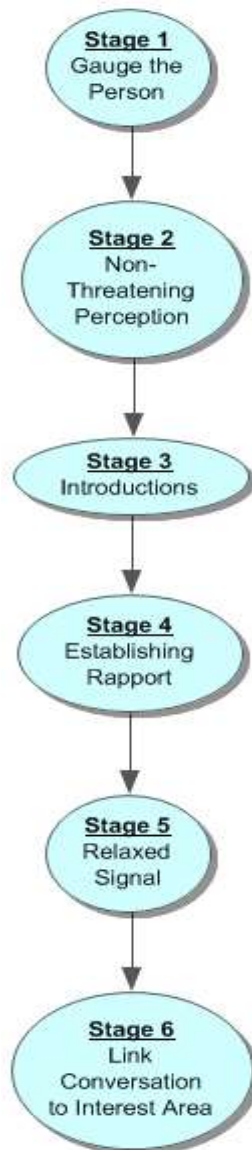


Figure 1 – Six stage protocol for Hawthorne effect mitigation

Stage 1 – Gauge the person

The first stage can be challenging. As previously discussed ethnographers are often perceived as and feel like ‘outsiders’ in the community. As an outsider, it can be difficult to gauge the types of participants with whom the ethnographer will engage (or liaise). It is important to gauge both the type of participants and the setting. The setting is important as people change their image and behaviour dependent on the setting, whether a professional or more social setting. It is often a good idea to try to engage with the participants in different types of settings. In this particular study, though the work setting was where the majority of data were gathered, when in a more social setting, the data was often richer and of high quality. This was due to the participants being more relaxed in a social setting and that there was less time pressure on the conversation lengths since the participants were not working.

Case example:

In this case example, from the subject’s appearance it was evident he was a labourer and from his accent (from hearing his voice as he walked past) he was Scottish. From past experience, Scottish labourers generally have a broad accent and a ‘laddish’ nature, with interests of football, beer and women amongst others. Though this is a stereotypical approach these are the presumptions I would make in order to adapt my behaviour and become immersed in the setting.

Stage 2 – Create a non-threatening perception

Once within the setting, creating a non-threatening perception is vitally important for the researcher. From gauging participants in the previous stage, the researcher should have a better idea of what image to portray. Often it is a good idea to dress in a casual manner to look non-threatening. It is also worth planning your behaviour within the setting. As previously mentioned, an ethnographer is likely to feel like an outsider, so thinking what type of participant observation is most suitable for the research is important. For those that are using complete or active participation, their roles within the setting are generally clear, and therefore their behaviour within the setting is more apparent. They are completely integrated into the population and therefore generally have the same roles as the other participants but this also risks ‘going native’. Going native is a danger for ethnographers that become too involved and lose their objectivity and distance (O’Reilly, 2009). Moderate participant observers avoid this problem by having ‘insider’ and ‘outsider’ roles which allow for involvement and necessary detachment to remain objective (DeWalt et al., 1998). However, their roles are not as clear and hence their behaviour within the setting becomes very important. Unlike complete participants they are not present all the time and may not undertake the same roles as the others within the setting. Therefore, they may feel more like an outsider without a clear role. In this scenario, the researcher needs to identify a clear role and behaviour

within this setting. In this study a moderate participant observation approach was used. The researcher's role is to observe, communicate and interact with the workers, but not to work with them. The behaviour of the researcher becomes important here, as the workers need to be at ease when the researcher is present. After discussions with the workers, it was clear that the workers found that those who directly observe without introducing themselves were quite daunting. It would make the workers question themselves as to whether they were carrying out their role correctly and make them more likely to make a mistake. Therefore, as a moderate participant observer, I have since made an effort to always introduce myself on each occasion I enter a works area. My behaviour within the works areas then becomes consistent, normal and the workers know what to expect. This approach is more likely to keep the workers at ease, as they are aware who I am, my purpose and this is also one of the first stages in establishing rapport.

Case example:

Managing your self-presentation is a technique that can be used for building relationships (Jorgensen, 1989). For example, to go out observing construction workers in a suit with a clipboard would potentially be intimidating for the workers and hence would create a potentially threatening perception. Therefore it is important to wear clothing that will fit in with the culture, have a relaxed demeanour, be smiley and approachable. It is also an advantage to use different approaches to data collection and observation as this leads to a richer understanding of the participants and the social context (Kawulich, 2005). Therefore, in this study, different points of reference were used when observing. For example, when on-site I have been accompanied by various different personnel, such as safety advisors, works managers, students and PR officers, as well as going alone. When with these different points of reference, I witnessed changes in behaviours from the workforce. For example, when accompanying a group of undergraduate students on a site visit and during a large concrete pour, a student and I happened to be standing next to the operator controlling the extraction of concrete with a remote control. This was one rare occasion when a direct observation method (rather than participant observation) and unintentional covert positioning was used. Assuming I was an undergraduate student, rather than a researcher, the operator opened conversation by offering the student beside me to use the remote control. Offering a student and visitor to take control of a major concrete pour, knowing the visitor was unqualified for this task is a behaviour that would have been very unlikely to have occurred if there was a safety advisor present rather than a group of students. Behaviours that are more common when alongside the safety advisor are for the workforce to briefly stop work and quickly put on any required personal protective equipment that they are not wearing (e.g., gloves or safety glasses) and clean and clear the work area. While it is important to realise how these different points of reference

influence behaviour, the observer should also try to be aware of how their gender, sexuality, class, ethnicity and approach may influence findings (DeWalt and DeWalt, 2002).

Stage 3 – Introductions

Introductions are the essential foundations in establishing rapport with the participants in the setting. Though meeting new people can be stressful for some, it is important to remain calm and relaxed. Being relaxed and calm will not only help the researcher introduce him or herself but it is also more likely to create a non-threatening environment. Being interested in their roles is often a good strategy and it is also important to respect their setting, which in this study was the participant's place of work.

Case example:

Researcher: Alright mate, how you doing?

Scaffolder: I'm good pal, you?

Researcher: Aye, I'm no bad. What you working as on the project?

Scaffolder: I'm a Scaff, mate. What you daeing?

Researcher: Class mate - I'm a researcher looking at safety.

Scaffolder: Good son. Someone needs to look at it like! How did you get that gig?

Analysis:

Participant observation has been defined as establishing rapport and learning to act in a certain way so that the members will act naturally, before removing oneself from the community to analyse the data (Bernard, 1994). Here, the use of slang words such as 'pal' and 'class' as well as standard slang phrases such as 'alright mate' and 'I'm no bad' are typical amongst working class Scots with a broad accent. Hence, to become immersed in the setting and not to stand out, this act (using such slang words) is used so that the scaffolder is more likely to behave naturally. It is also important not to be judgemental. The slang word 'scaff' can be used as an offensive word used to describe someone with little money and a rough appearance. The use of 'scaff' within slang is likely to have stemmed from 'scaffolder', as scaffolding can be perceived as a relatively low paid profession and due to the nature of the job, scaffolders often have a rough appearance. Being judgemental of such a working class role would be ethnocentric, promote stereotyping and would also ruin any chance of building a friendly relationship, hence my reply: 'class, mate'. Traits, such as a non-judgemental approach and openness, are key characteristics of participant observation (DeWalt and DeWalt, 1998) and any errors or miscalculations in such human relations can be detrimental to the research (Fetterman, 2010).

From previous conversations with workers, some have been dismissive when I alluded to myself as a 'student.' The workers appeared to be more open with a 'researcher' rather than a 'student', hence why I introduced myself as a 'researcher' investigating safety. From previous

conversations on site, this is probably to do with some workers perceptions that students are lazy, drains on society that drink alcohol frequently. In this paper, the scaffolder's name has remained anonymous to protect the individual's ethical rights. This is the case for all the subjects and participants in this study, who are purposely not named or given false names. The project itself is also deliberately not identified. As a participant observer, as well as to protect the participants and the project, it is also important to introduce the purpose for you being there (Kawulich, 2005).

In this case, the introductions have gone very well: the scaffolder has not been dismissive and also has not been judgemental about the fact I'm researching safety responding with: 'Good son. Someone needs to look at it like'.

Stage 4 – Establishing rapport

Rapport is a state of harmonious understanding with another individual and is essentially building a friendly relationship. Establishing rapport with your participants is essential for researchers as it improves communication, creates trust and importantly improves the quality of data. This stage can be established quickly but it can also take days, weeks or even months, depending on the participants and the contact frequency. During conversations it is helpful to:

- have an open and accepting body language
- to maintain some eye contact (if culturally appropriate)
- nod and appear interested smile
- try to agree with the participant, as establishing rapport is about finding similarities with each other. Even if you disagree with 90% of what is being said, make it clear you agree with the other 10%
- try to use their name early in conversation. This makes the conversation more personal and helps the researcher remember it
- be complimentary where appropriate
- use previous conversations with the participant to build on for future conversations

Case example:

(Conversation continued)

Researcher: Well I got a Uni degree in Structural Engineering with Fire Safety, then decided to go down the safety route, and got into research.

Scaffolder: Quality mate, Structural Engineering degree aye!? How old are you?

Researcher: 23 mate.

Scaffolder: That's quality! Here buddy, (turns to his friend, who is passing) this boys got a structural engineering degree at 23! Quality eh?

Scaffolder's Friend: Aye good son – that's a good job like.

Researcher: Cheers!

Scaffolder: 23... you're just older than my laddy!

Analysis:

It is clear that a friendly relationship is being built. The scaffolder is being very complimentary about my degree and the conversation is going to turn to his more personal family life and in particular, his son. He appears at ease and comfortable and very soon he confirms, with a cheeky joke, that he is very relaxed around me.

Stage 5 – Relaxed signal

One of the most important stages to reach during engagement is the point where surrounding participants feel relaxed around you, as then they are more likely to express their true perceptions. The biggest indicator of reaching this stage is generally a light-hearted comment or joke, such as the comment made about my youthful looks at the beginning of the section. This stage usually occurs at some point during Stage 4 (Establishing Rapport) and demonstrates that the relationship has been built to a new level.

Case example:

(Conversation continued)

Researcher: Aye, how old is he?

Scaffolder: He's 19... Oh I started young (he has a cheeky smile, he laughs and winks)

Researcher: Good man! (laughs and smiles back)

Analysis:

The scaffolder has made a joke that he was sexually active from a young age – a signal that he is relaxed around my presence. I smiled and laughed back because, apart from the fact it was quite funny, this continues to build the relationship as it shows that you are enjoying each other's company. The conversation now returns to Stage 4, discussing another one of the presumptions gauged: his interest in football.

Stage 4

Case example:

(Conversation continued)

Researcher: He into any sports or that?

Scaffolder: Aye he's into his football – you?

Researcher: Yea same, play for the Uni.

Scaffolder: Class mate, they play at Peffermill eh?

Researcher: Aye, got a new 3G pitch there – cost like 800 grand!

Scaffolder: Was gonna say I thought I saw that the other day when I was driving past.

Researcher: Aye its class mate – same size as Hampden!

Scaffolder: Brilliant, Scottish football needs more decent facilities.

Analysis:

Stages 1 to 5 have been successfully completed and now it is important to direct the conversation to the interest area at an appropriate moment. Note the slang language that has been present throughout the whole conversation, to become immersed in the setting, for example 'mate', 'aye', 'class', 'quality', 'son', 'pal' and 'scaff'.

Stage 6 – Link to conversation area

Once it is clear that the participant is relaxed in the researcher's presence, the researcher should try to change the topic of conversation to the researcher's interest area. The following section is an example of this protocol in use.

Case example:

(Conversation continues)

Researcher: Sure does. So how long you been a Scaff for?

Scaffolder: Since I left school – needed a job for the bairn eh. (note "bairn" = "child")

Researcher: Aye, course mate, you ever seen any bad accidents in your time?

The conversation has now been linked to the interest area, and the rest of the discussion revolved around safety in construction. During this discussion the scaffolder made the following statements of interest to my research:

- He had witnessed fatalities.
- Management just mainly care about money.
- Subcontractors are promised "the world" to get the job done quickly and hence often cut corners.
- Workers coming in to do short jobs on the same site as others, such as joiners, often try to do jobs quickly and unsafely to get onto the next job.
- He had refused to work in an area he thought was unsafe and got moved to another site. Less experienced workers often wouldn't refuse to work even if they thought it was unsafe for fear of their jobs.
- Foreign workers who cannot speak fluent English should not be allowed to work on site in the UK as it is a safety hazard.
- Workers that have been taking risks for 20 years won't change their ways because they have avoided a serious accident.

Reflections

The scaffolder was very open, giving some interesting and, in some cases, controversial statements. These statements may not have been made without passing through the conversation protocol. The factual correctness of these statements is not the issue here; it is that they have been made as a true reflection of the scaffolder's attitudes. They suggest the observer has been

accepted by the scaffolder, and that observations reveal a more natural behaviour, less likely to be affected by the Hawthorne effect.

As the researcher begins to immerse into the setting the protocol becomes easier to implement. The researcher has a greater understanding of the subjects and is able to improve his judgement when attempting to gauge them in Stage One. Realising what perception to adopt can also improve through on-site experience, and how to appear non-threatening. Understanding the different behaviours that diverse subjects have will come through site involvement and even other seemingly less important details, such as what to wear while researching, will become clearer. For example, once on approach two workers were being quite dismissive because of the green jumper I was wearing as they were big fans of Rangers, a Scottish football team who predominately wear blue and have a big rivalry with another team, Celtic, who predominately wear green. When blue and green hard hats and gloves were being returned for a different colour, I began to understand that those with this view-point were likely to be more than just the two workers I spoke with. Hence to even avoid this scenario re-occurring, I avoided wearing green or blue on-site as many workers have a strong passion for football and Celtic and Rangers are two very well-supported clubs in Scotland. This is an example which demonstrates that the six stage protocol does not always work as well as the case example due to different reactions from diverse subjects. There are many other reasons such break down could occur, such as language barrier issues or conversation time restrictions. However, the success rate of the protocol does improve with more on-site experience and when it is proceeding successfully it is often clear to the observer. This is important as it is then obvious to the researcher when the Hawthorne effect has been overcome and avoided. The data collected from these types of successful conversations is likely to be richer, detailed and more accurate.

Other challenges for the participant observer

Observing evidence

Observation of evidence can be a powerful tool for learning about certain behaviours. In this study, evidence could be used to learn about the workers' safety behaviours, though it was crucial to have a good understanding of the research area. See Figure 2 showing inside the scaffold.

Researchers without any prior knowledge in the construction industry may not recognise anything unusual, (namely the single planks at the end of the scaffold). Even if the researcher did notice this, he/she may not think it is of any significance. My conclusion was that it was being used for inappropriate access, namely a scaffolder had been walking along these planks creating a risk of falling from height. Even if the scaffolder was harnessed on during this act, it would still not be acceptable practice. Though to check if this was the case, two independent employees on the

project were asked: an experienced safety advisor and a works manager. Both of whom confirmed that this was the case.

This process of verifying what is observed through conversations with other participants in the setting significantly reduces the risk of misinterpreting evidence.



Figure 2 – Planks placed at the end of a scaffold

Evidence can also become distorted. For example, when on-site I walked into the following poor access route shown in Figure 3, my initial thought was that the workers nearby the messy access route had created the trip hazards. Again, to check that there was no misinterpretation, a nearby worker was questioned, and he responded saying that the planks of wood had instead come from the top of the scaffold. It was later confirmed by the supervisor that the planks had been 'bombed' or thrown from the top of the scaffold. In this case the evidence had been distorted, originally the messy workplace was at the top of the scaffold, but when I had observed the site, it had been moved. Again, understanding and checking all conclusions based on evidence is key to avoid any misinterpretations. This etic/emic challenge – emic is a view from within, while etic is a view from the outside (Pike, 1966) – is an important challenge (Kellehear, 1993) that a researcher must attempt to overcome as misinterpreting evidence and data could lead to potentially incorrect conclusions.



Figure 3 – Planks in the access route creating trip hazards

Methodological positioning of the study

Whilst detailed discussions are beyond the scope of this paper, it is still necessary to position the study within its wider methodological context. A realist ontology and interpretive epistemological position have been established, which consequently raises other considerations for the participant observer.

The development of this protocol seeks to support in part the validity and reliability of the research, enabling others to repeat the research process to achieve the same depth and richness of data whilst providing confidence in the process of data collection. Within this epistemological framework, the issue of bias will need to be addressed, and in part the protocol put forward in this paper seeks to address and mitigate such effects. A key criticism of observational data is that the researcher's own perceptions create bias. Although this point may be valid, observational research provides a unique holistic perspective of organisational life which many other research methods do not (Hanlon, 1980). It can also be argued that within the context of the construction site, some degree and application of an emic perspective is needed to translate this highly specific and unique environment to the wider reader and produce appropriate research outcomes.

Validity

The participant observer is a tool that can be used to increase the validity of the study (Bernard, 1994) as being familiar with and immersed into the surroundings can bring many benefits. For example, the observer can

facilitate an involvement in sensitive activities that the researcher may generally not be invited to. Also, an ethnographer can develop questions in the native language or in a way in which the respondents would have greater understanding. With relation to the construction industry, many workers leave school with few qualifications and some struggle to, or cannot, read or write; therefore use of more basic language is important in such a culture.

Though participant observation can increase validity, there are challenges with recording, collecting and analysing the data. Creating a sound strategy for recording observations as completely as possible is an important step for participant observers (DeWalt and DeWalt, 2011). Careful reporting and documentation of how the methodological choices were made, the circumstances under which they were recorded and how they were analysed, allows the reader to assess the validity and allows for interested parties to reproduce the work if they desire. Bernard (1994) suggests the observer should remain naïve yet competent, to only record what he/she sees rather than what is implied and not to not speak to any other participants about what has been seen before recording the data.

The first challenge to address when gathering data is to assess whether the participant observer technique could give valid answers to the researcher's questions (DeWalt and DeWalt, 2011). Though this may not be obvious at the beginning of the work, as the research progresses it will become clearer what questions could be answered using participant observation. The overall aim of the wider research in this study is to identify which factors influence unsafe behaviours on a construction site. While some factors such as 'time pressure' could be answered using participant observation, others such as 'thrill-seeking' (where risks are taken purely to gain a thrill from it) are more difficult to interpret as how could one state for sure that an unsafe act was taken for thrills? Therefore perhaps a more appropriate research technique to investigate the 'thrill seeking' factor may be to use observation techniques alongside a validated psychological risk taking test.

Another challenge is selecting and determining whether the research site will yield valid findings (DeWalt and DeWalt, 2011). It is important to choose an appropriate research site and if there are two or more possible and equally appropriate locations within the site, the researcher should attempt to give the same attention. At the time of writing on the research project in question, there are construction works on land, which are mainly British-based workers and on barges, which are more of a mixture of British and European workers. Both locations are of equal interest to the researcher, so despite access to the barges being more difficult, giving both locations equal attention will help to validate any conclusions of behaviour based on cultural or national background.

As previously mentioned triangulation is an important technique in attempting to overcome the Hawthorne effect, but it is also very useful in

cross-referencing observations to validate findings. Heuristic representativeness is a mental shortcut that was proposed by psychologists Tversky and Kahneman (1974). This mental shortcut occurs when we judge the likelihood of an event by how well it corresponds with previous similar events. While this enables us to make conclusions quicker, it can also lead to errors. Participant observers should avoid making such judgement calls on activities, venues and informants without cross-reference clarification.

DeWalt and DeWalt (2011) also note that the researcher should plan on how to best analyse the collected data. For the research project in question, the majority of the data collected from this type of research will be rich, detailed and varied data, which can be challenging to analyse. Grounded theory is being used as it is a useful technique for rich and detailed data and is ideal for continuous comparisons, which suit the lengthy timescale of the project (over four years).

Reliability

The classical approach to ensuring reliability in a laboratory or experiment is to repeat the experiment. This approach is only applicable to phenomena that are unchanging and therefore when dealing with social phenomena, this would be a very shaky approach, since it is almost unquestionable that social conditions are always shifting (DeWalt and DeWalt, 2011). If two researchers were to investigate the same research at the same setting but at a different time, due to the nature of social change, this may not necessarily be a fair test of reliability.

Therefore another, more appropriate way to test reliability for this research project, is to carry out several observations at around the same time (Dewalt and DeWalt, 2011). Since similar types of construction work will be reoccurring for a fairly significant period, this approach is possible for this research. The same issues can also be discussed with a wide range of participants from varying nationalities and backgrounds. Another method for testing reliability is to have another participant observer gathering data at around the same time period (DeWalt and DeWalt, 2011), allowing direct comparisons of findings.

Conclusion

In ethnography, participant observation is one of the main tools for gathering and analysing data. Whilst a challenging research method, if participant observation is utilised successfully the researcher can be rewarded with unique and detailed findings. Ethnographers have been concerned with reactivity such as the Hawthorne effect where the subjects change their behaviour as a result of being observed or studied. Establishing rapport with the subjects is essential for overcoming the Hawthorne effect and gathering quality data. A six stage conversation protocol has been

outlined in this paper as a process to overcoming the challenges of this Hawthorne effect phenomenon.

There has been decades of debate over the Hawthorne studies and the true meaning of the Hawthorne effect. Through lived researcher experience on this project the early indications suggest that the Hawthorne effect does exist and remains a key challenge that a participant observer must overcome. The most important stages to reach in order to overcome this challenge are to build a good relationship with the surrounding participants and to ensure they are relaxed in your presence. A signal that the surrounding participant is completely relaxed in your company is often a joke or light-hearted comment. Through a case study example, it has been shown that the observer's subject eventually reveals behaviour which would not ordinarily be observed before establishing rapport. Despite being in a confrontational industry, this protocol will ensure further behavioural safety research can be conducted in a more robust manner, providing a better platform upon which interpretations can be made.

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